APPENDIX 1. CREW QUALIFICATION AND PILOT TYPE RATING REQUIREMENTS FOR TRANSPORT CATEGORY AIRCRAFT OPERATED UNDER FAR PART 121 - SYSTEM, PROCESS, AND TEST DESCRIPTIONS.

1. PURPOSE. This appendix provides a comprehensive description of a system for crew qualification outlined in this AC. It includes definitions, criteria, processes, tests, methods, and procedures necessary for uniform application of the system.

2. FOCUS. The appendix applies to and is used by:

a. Aircraft manufacturers or modifiers who design, test, and certificate Part 25 transport aircraft or variants of those aircraft,

b. Air carriers who operate under Part 121, including the AQP SFAR if applicable,

c. Operator, manufacturer, or other training centers having programs approved for use under Part 121, or

d. FAA offices and inspectors administering programs under Part 121.

3. RELATED READING MATERIAL. FAR Parts 1, 61.31, 61.57, 61.58, 61.63, 61.153, 61.157, 61 Appendix A, 121.401, 121.403, 121.405, 121.407, 121.409, 121.413, 121.417, 121.418, 121.419, 121.421, 121.422, 121.424, 121.427, 121.433, 121.434, 121.437, 121.439, 121.440, 121.441, 121 Appendix E, 121 Appendix F, Advanced Qualification Program (AQP) SFAR; current editions of AC 61-89, AC 120-35, AC 120-40, AC 120-45, AC 120-46, AC 120-51; and FAA-S-8081-5 Practical Test Standard.

4. INTRODUCTION.

4.1 A Comprehensive System for Crew Qualification. This AC and appendix provide a means to systematically address requirements for training, checking, and currency within rules prescribed in Federal Aviation Regulations (FAR) Part 121 Subpart N and O including Appendices E and F. These provisions also apply to those air carriers who have programs approved under the Advanced Qualification Program (AQP) Special Federal Aviation Regulation (SFAR). Definitions, criteria, processes, procedures, tests, and methods are consistent with and clarify application of current rules and the SFAR in particular situations for specific aircraft types and

variants. A comprehensive system is provided for use by the Federal Aviation Administration (FAA) and industry to describe, evaluate, and approve use of particular aircraft and operator programs. The respective roles of airmen certification, training, checking, and currency are clarified. This includes defining the role and criteria for designation of type ratings for existing, new, derivative, or modified aircraft. The system is particularly suited to addressing differences programs, mixed fleet flying, and transition between variants. The system aids in assuring attainment and maintenance of knowledge, skills, and abilities that are needed by flight crews to safely operate assigned aircraft, including variants. The system provides a standardized means to credit or constrain mixed fleet flying of variants or transition between variants.

4.4 Master Requirements Set by FAA. The system is based on application of standardized requirements for operation of new type, common type, related types, or variants of those aircraft. Requirements are set by the FAA's Flight Standardization Board (FSB) with industry and public comment. Requirements are set in the form of master common requirements (MCR's) or master difference requirements (MDR's). MCR's are for new aircraft or for those requirements which are common to any variant. MDR's address differences and are for mixed fleet flying of variants or for transition between variants. master common requirements or master difference requirements address specification of any necessary pilot type ratings.

4.5 Specification of Constraints or Credits. The system permits the specification of any type or variant specific constraints or permissible credits. Constraints or credits may relate to knowledge, skills, abilities, devices, simulators, maneuvers, checks, currency, or any other such factors necessary for safe operations. Constraints or credits may be applied generally to a type, common types, or related types, or only to specific variants, particular crew positions, or other situations or conditions.

4.6 Recognition of Unique Operator Characteristics. The system recognizes the unique characteristics of individual air carriers while achieving uniformity in application of broad FAA safety standards. This is done by tailoring individual operators unique requirements to a particular fleet and situation within uniform bounds determined by FAA master requirements. FAA principal inspectors approve each operator's unique requirements within FAA master requirements. Operator unique requirements accommodate particular combinations of aircraft or variants flown, crew assignment policies, training methods and devices, and other factors which relate to application of the FAA master requirements to safe operations for a particular operator. Accordingly, the system preserves operator flexibility while standardizing the FAA's role in review, approval, and

monitoring of training, checking, and currency programs under Part 121 and in conducting airmen certification.

4.7 Basis for Requirements. The determination of type rating, differences training, checking and currency requirements focus on basic operation of aircraft in the National Airspace System (NAS) under both instrument flight rules (IFR) and visual flight rules (VFR). Included are all flight phases from preflight to shutdown under both normal and non-normal conditions. Assessments are based on use of standard US or ICAO navigation aids and procedures.

4.8 Relationship to other FAA Policies. Although this AC and FSB requirements in some instances address particular types of operations or specific aircraft systems such as use of flight guidance control systems for Category II/III instrument approaches, long range navigation, and other topics, these issues are primarily addressed by criteria of other AC's. This AC and FSB requirements address such issues only to the extent necessary to assure that crews are qualified to operate pertinent systems or equipment as part of initial or continuing qualification for a particular type or variant.

4.9 Other Applications of this AC. While the primary application of this AC is for air carriers and crews operating under Part 121, and manufacturers and modifiers of those aircraft, the provisions may also be used by training centers having programs approved under Part 121. Procedures for determining type rating requirements may be applied to all U.S. certificated transport category airplanes even though not used in Part 121.

5. DEFINITIONS.

5.1 Aircraft Evaluation Group (AEG). FAA, Flight Standards organization which sets training, checking, currency, type rating, master minimum equipment list (MMEL), and maintenance standards (maintenance review boards) for assigned aircraft types. AEG's also address operational aspects of aircraft type certification and resolution of service difficulties.

5.2 Base Aircraft. An operator designated aircraft or group of aircraft used as a reference to compare differences with other aircraft within an operator's fleet.

5.3 Common Type Rating. A single pilot type rating assigned to two or more aircraft which have separate type certificates and are not related as derivative aircraft (e.g., B-757 and B-767).

5.4 Currency. Currency as used in this advisory circular is that recent experience necessary for safe operation of aircraft types or variants as designated by the FSB. When addressing flight experience required by Section 121.439, currency is considered to have the same meaning as recency of experience (also see Recency of Experience).

5.5 Configuration. Aircraft physical features that are distinguishable by pilots with respect to differences in systems, cockpit geometry, visual cutoff angles, controls, displays, aircraft geometry and/or number of required crew.

5.6 Difference. A change which may affect crew knowledge, skills, and/or abilities, or otherwise alters the crew interface with the aircraft (e.g., control/indicator relocation, addition, deletion, and/or change in function; modified panel scan requirements; increase/decrease in operational tasks; change/improvement in technology; etc.).

5.7 Difference Levels. Difference levels are formally designated levels of training methods or devices, checking methods, or currency methods which satisfy differences requirements or type rating requirements pertinent to Part 121. Difference levels specify FAA requirements proportionate to and corresponding with increasing differences between groups of variants. A range of five difference levels in order of increasing requirements, identified as A through E, are each specified for training, checking, and currency.

5.8 Differences Training. The training required for crewmembers and dispatchers who have qualified and served on a particular airplane to

assure the necessary knowledge and skills to safely serve in the same capacity on a particular variant of that airplane. (See FAR Part 121, Subpart N.)

5.9 Flight Characteristics. Flight characteristics are handling qualities or performance characteristics perceivable by a flightcrew. Flight characteristics relate to the natural aerodynamic response of an airplane, particularly as affected by changes in configuration and/or flight path related parameters (e.g., flight control use, flap extension/retraction, airspeed change, etc.).

5.10 Flight Operations Evaluation Board (FOEB). The FAA board responsible for preparation and revision of MMEL's.

5.11 Flight Standardization Board (FSB). The FAA board responsible for specification of training, checking, currency, and type rating requirements if necessary for U.S. certificated civil aircraft.

5.12 Handling Characteristics. Means the manner in which the aircraft responds with respect to rate and magnitude of pilot initiated control inputs to the primary flight control surfaces (e.g., ailerons, elevator, rudder, spoilers, etc.).

5.13 Major Change. A change or changes within an aircraft type or related types which significantly affect crew interface with the aircraft such as: flight characteristics; normal, non-normal or emergency procedures; recall action items; design or number of propulsion units; change in number of required crew; etc.

5.14 Master Common Requirements (MCR's). Master common requirements are requirements applicable to crew qualification which pertain to all variants of the same type, common type, or related types. MCR's are specified by the FSB when an aircraft is originally type certificated and are revised as necessary when variants are developed. When variants exist MCR's specify only those items which are common to all variants.

5.15 Master Difference Requirements (MDR's). Master difference requirements are those requirements applicable to crew qualification which pertain to differences between variants of the same type, common type, or related types. MDR's are specified by the FSB in terms of difference levels. MDR's apply between particular pairs of variants or variant groups, and are shown on an MDR table.

5.16 Minor Change. A change other than a major change, as specified in 5.13.

5.17 Mixed Fleet. A particular operator's fleet which contains a base aircraft and one or more variants of a same type, common type, or related type aircraft.

5.18 Mixed Fleet Flying. Mixed fleet flying is operation of a base aircraft and one or more variants of the same type, common type, related type, or a different type by one or more flightcrew members, between training or checking events.

5.19 Operating Experience. Initial operating experience (IOE) acquired on a particular aircraft type as provided for by Section 121.434.

5.20 Operational Characteristics. As used with respect to aircraft, means those features which are distinguishable by limitations, flight characteristics, normal procedures, non-normal procedures, alternate or supplementary procedures, or maneuvers.

5.21 Operator Difference Requirements (ODR's). Operator difference requirements are a formal description of differences between variants flown by a particular operator, with a corresponding list of FAR compliance methods pertinent to training, checking, and currency.

5.22 Proficiency. Proficiency is the possession of sufficient knowledge of aircraft systems, characteristics, limitations, procedures, and necessary skills to competently and safely perform assigned duties. Performance of assigned duties is considered to include the ability to accomplish required maneuvers and procedures within or in accordance with established criteria.

5.23 Qualification. The combination of applicable experience, training, checking, certification, currency, and any other special requirements as defined in Part 121, Subpart O, or the Advanced Qualification Program (AQP) Special Federal Aviation Regulation (SFAR), which permit authorization to serve as a crewmember for a specific crew position in air carrier operations.

5.24 Recency of Experience. With respect to flight experience as required by Section 121.439, means an airman's completion of the required number of takeoffs and landings as manipulator of controls within the preceding 90 days, in an aircraft of same type, common type, or related type as specified by the FSB. With respect to training means the number of days since completion of an approved flight, ground, or simulator training program and completion of a pertinent check, if applicable. With respect to other applications means meeting pertinent FSB criteria as designated in

FSB reports for a given type, common type, or related type aircraft. Recency of experience is considered to have the same meaning as the term currency when used in this AC and FSB reports (also see Currency).

5.25 Related Type Rating. A different pilot type rating assigned to a variant with the same or an amended type certificate (e.g., B-747-400 is related to the B747-100/300) or a variant with a different type certificate.

5.26 Same Type Rating. A single pilot type rating assigned to two or more variants which have a single type certificate (e.g., DC-8 for the DC-8-50, DC-8-60, and DC-8-70 series).

5.27 Series. As used with respect to aircraft, means those aircraft with a single type certificate which have a specific derivative designation usually defined by the manufacturer and which usually result in an amended type certificate (e.g., B-737-100, B-737-200, and B-737-300).

5.28 Supervised Line Flying (SLF). A specific type of IOE during which a pilot occupies a specific crew position and performs particular assigned duties for that crew position which are related to postqualification skill enhancement.

5.29 Training Footprint. A training footprint is a summary description of a training program, usually in short tabular form, showing training subjects, modules, procedures, maneuvers or other program elements which are planned for completion during each day of training.

5.30 Type Certificate (TC). Original TC: A new type certificate for an aircraft for which no previous type certificate has been issued. Amended TC: An existing type certificate modified to include changes. Supplemental TC: A type certificate issued to modifiers of aircraft without change to the existing type certificate for that aircraft.

5.31 Type Rating (See Part 1 of the FAR, "Type"). A type rating is a "one time" permanent endorsement on a pilot certificate, recorded by the FAA, which is required by the FAR in order to serve as pilot-in-command of a U.S. civil large or turbojet aircraft. As used with respect to the certification, ratings, privileges, and limitations of airmen, means a specific make and basic model of aircraft, including modifications, that do not change its handling or flight characteristics. The term "new" type rating is used when a pilot type rating is first assigned during the initial certification of a new aircraft type. The terms "different" or "separate" type rating are used when an additional pilot type rating is assigned to a variant which does not qualify for a "same" or "common" type

rating.

5.32 Variant. A variant is an aircraft or a group of aircraft with the same characteristics that have pertinent differences from a base aircraft. Pertinent differences are those which require different or additional flight crew knowledge, skills, and/or abilities that affect flight safety.

6. CONCEPTS.

6.1 An Integrated System for Crew Qualification.

6.1.1 System Elements. An integrated FAA/manufacturer/operator system and process is established for crew qualification to uniformly determine appropriate requirements, apply requirements, and meet those requirements on a continuing basis. The system addresses crew qualification for specific types, common types, related types, and particularly addresses differences between variants. The system is based on FAR Parts 1, 61, 121, may be used in conjunction with the AQP SFAR, and includes:

a. definitions of terms, concepts, roles, and responsibilities;

b. criteria for testing, establishment of requirements, and approval of programs; and

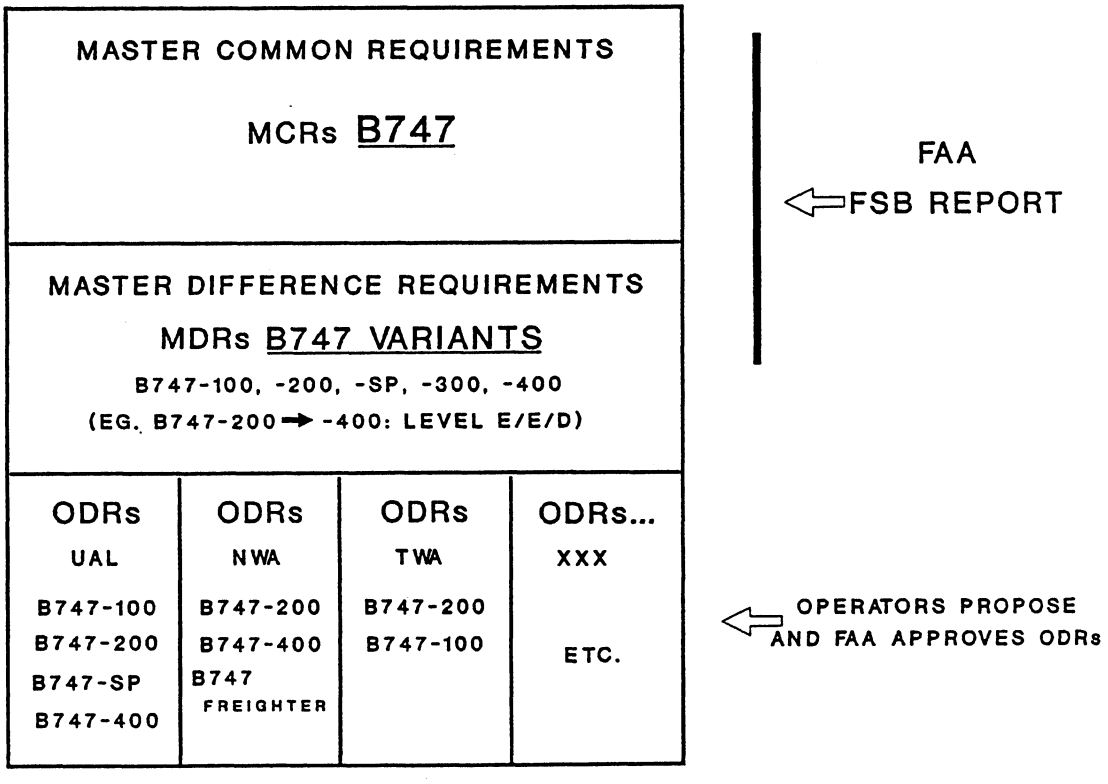
c. processes to determine, apply, comply, and revise requirements for crew qualification applicable to training, checking, and currency.

6.1.2 System Overview. The system uniformly applies FAA master requirements in a way which may be tailored to particular aircraft types, variants, and an operator's unique situation or fleet. This is accomplished through specification and FAA approval of unique operator and fleet requirements for each operator based on FAA master requirements. FAA master requirements are developed based on objective criteria and tests, with industry support for analysis, testing, and public comment. FAA master requirements are described in FSB reports for each type, common type, or related type aircraft. FAA master requirements are expressed either in the form of master common requirements (MCR's) or master difference requirements (MDR's) as described in sections 6.2 and 6.3. MDR's are stated in terms of minimum acceptable difference levels between variants. MCR's and MDR's directly pertain to FAA offices' and inspectors' application of rules and policies to crew qualification. Thus, MCR's and MDR's indirectly apply to operators and airmen through the FAA approval process. Operators comply with MCR's and MDR's as a byproduct of training program, checklist, manual, airmen certification, and other such approvals. Operators comply with MDR's through the use of unique operator difference requirements (ODR's) which are tailored to that operator's programs and are approved by FAA. ODR's specify requirements uniquely applicable to a particular air carrier's fleet and mixed flying situation but are based on and comply with MDR's. ODR's are described in an operator specific document which identifies a base aircraft, differences between variants, and that operator's compliance methods for each particular variant or variant group. ODR's are described in section 6.8. ODR preparation and

use is described in section 8 and approval of ODR's by FAA is in section 9.
6.1.3 An example of the relationship between MCR's, MDR's, and ODR's for the B747 is shown in figure 6-1 .

FAR 121 TRAINING, CHECKING, AND CURRENCY

(APPLICATION OF FSB REQUIREMENTS)



ODRs SHOWN ARE EXAMPLES ONLY

ODRs = OPERATOR DIFFERENCE REQUIREMENTS

FIGURE 6-1

6.2 Master Common Requirements (MCR's).

6.2.1 MCR Applicability. Master common requirements are requirements applicable to crew qualification which pertain to all variants of the same type, common type, or related types. They include requirements for training, checking, and currency for new aircraft and for common application to any variant when variants exist.

6.2.2 MCR Content. Master common requirements set training, checking, and currency requirements necessary to apply FAR to a particular type or types. For example, training programs typically acceptable to FAA are described, particular methods acceptable for accomplishing various check maneuvers applicable to FAR 61, Appendix A; FAR 121, Appendix F; or AQP flight qualification events are shown, criteria for acceptable maneuver performance are established if necessary, and maneuvers which are not applicable or which may be waived are identified. Any special knowledge or flight characteristics requiring training or evaluation are described. Where MCR's do not need to specify type unique information, the FAR and FAA's general policies for training, practical test standards, and other such references directly pertain without the need for additional specification, interpretation, clarification, or adjustment. MCR's are formulated in accordance with established FAA policies for initial, transition, upgrade, recurrent, and differences training and checking. Recurring requirements are consistent with initial requirements unless otherwise specified by the FSB.

6.2.3 MCR Formulation and Description. MCR's are formulated by the FAA Flight Standardization Board (FSB) designated for each aircraft type, common type, or related types. MCR's are originally specified when an aircraft is first type certificated. MCR's are formulated using standardized tests and evaluations in conjunction with the type certification or supplemental type certification process. MCR's are based on an applicant's (usually an aircraft manufacturer) proposal, FAA evaluation of that proposal, operational experience, and test results when tests are necessary. FSB determinations also consider operator recommendations, safety history, public comment, and other relevant information. MCR's are described in provisions of an FSB report.

6.2.4 MCR Revision. MCR's are periodically revised and kept current as necessary. MCR's are revised when variants are developed or modified, when tests or operational experience show a need for revision, when requested by operators or manufacturers and evidence indicates the need to make revisions, or when rules or FAA policies change. MCR's are revised by a process similar to that used for initial formulation of requirements.

6.2.5 MCR Use. FAA field offices use the MCR's as the basis for approval of individual operator's programs under the provisions of Part 121 and airmen certification under Parts 61 and 121. For AQP, MCR's aid in the assessment of an operator's curriculum and flight qualification events.

6.3 Master Difference Requirements (MDR's).

6.3.1 MDR Applicability. Master difference requirements are those requirements applicable to crew qualification which pertain to differences between variants of the same type, common type, or related types. MDR's specify the minimum acceptable difference levels between variants or variant groups that may be approved for operators. One variant or variant group is selected as a reference for comparison purposes and is considered a base aircraft. Difference levels between the base aircraft and other variants then specify the minimum difference requirements to be met for crew qualification. Variant groups describe major differences in a particular fleet rather than specifying each possible configuration and combination of configurations between variants or variant groups. MDR's are specified when at least one variant in addition to the original model is type certificated. MDR's may also pertain to common type qualification when a common type rating is assigned or to related types of derivative aircraft. MDR's are specified in terms of difference levels described in section 6.4 and are shown on an MDR table.

6.3.2 MDR Content. MDR's specify the minimum Part 121 training, checking, and currency acceptable to the FAA for crew qualification regarding differences. This includes any necessary methods, devices, or simulators required to safely accomplish mixed fleet flying or transition between variants.

6.3.3 MDR Formulation, Description, and Revision. MDR's are formulated, described, and revised by the FSB in a manner similar to MCR's. However MDR's are only specified in provisions of an FSB report when variants exist.

6.3.4 MDR Use. MDR's are used in a manner similar to MCR's, except that MDR's are applied to specific air carriers through formally described operator difference requirements (ODR's) which may be tailored to each operator. FAA field offices use the MDR's as the basis for approval of individual operator's differences programs for mixed fleet flying under the provisions of Part 121 Subparts N and O or the AQP SFAR. In some instances MDR's are also the basis for approval of initial or transition programs where credit for previous training or experience with other variants is

sought.

6.3.5 The MDR Table. An example of typical Master Difference Requirement for the B737 is shown in the table in figure 6-2. In an MDR table requirements are shown for each pair of variants or variant groups by notations in each element of corresponding columns and rows of the table. Each element of the table identifies the minimum differences training, checking, and currency requirements applicable to mixed fleet flying or transition between the referenced variant pair. Any special requirements or situations are shown by footnotes. The MDR table is read by identifying a pertinent base aircraft and particular variant for which requirements are sought, noting the minimum difference levels which correspond to the pertinent column and row, and identifying special requirements shown by footnotes, if applicable.

MASTER DIFFERENCE REQUIREMENTS (MDR) TABLE

AIRPLANE TYPE RATING:B737		FROM AIRPLANE				
		B737 BASIC B737-100/200 (SP77)	B737-200 ADV	B737-300	B737-400	B737-500
TO AIRPLANE	B737 BASIC B737-100/200 (SP77)	A/A/A (2) NAV - B/B/C (6) PMS - C/B/C	B/A/B (2) NAV - B/B/C (6) PMS - C/B/C	C*/C*/D	C*/C*/D	C*/C*/D
	B737-200 ADV	B/A/B (1) PDCS - C/B/C (2) NAV - B/B/C (4) AFCS - C/B/C (6) PMS - C/B/C	A/A/A (1) PDCS - C/B/C (2) NAV - B/B/C (4) AFCS - C/B/C (6) PMS - C/B/C	C*/C*/D (1) PDCS - B/B/C (2) NAV - B/B/C	C*/C*/D (1) PDCS - B/B/C (2) NAV - B/B/C	C*/C*/D (1) PDCS - B/B/C (2) NAV - B/B/C
	B737-300	C*/C*/D (3) EFIS (5) LIMITED FMS - C/B/C	C*/C*/D (3) EFIS (5) LIMITED FMS - C/B/C	A/A/A (3) EFIS - C/B/C	A/A/B (3) EFIS - C/B/C	A/A/B (3) EFIS - C/B/C
	B737-400	C*/C*/D (3) EFIS (5) LIMITED FMS - C/B/C	C*/C*/D (3) EFIS (5) LIMITED FMS - C/B/C	A/A/B (3) EFIS - C/B/C	A/A/A (3) EFIS - C/B/C	A/A/B (3) EFIS - C/B/C
	B737-500	C*/C*/D (3) EFIS (5) LIMITED FMS - C/B/C	C*/C*/D (3) EFIS (5) LIMITED FMS - C/B/C	A/A/B (3) EFIS - C/B/C	A/A/B (3) EFIS - C/B/C	A/A/A (3) EFIS - C/B/C

Notes:

C* - Denotes level C training or checking which at least requires use of specific level C training devices with detailed characteristics specified in the FSB report.

(1) Installation of Performance Data Computer System (PDCS) requires additional training, and currency.
(2) Installation of INS or Omega Navigation System (ONS) requires additional training, checking, and currency.
(3) Systems device required for EFIS (if applicable)
(4) Installation of AFCS requires additional training, checking, and currency.
(5) If the FMS on the 737-300/400/500 airplane retains only partial functions (such as SWA configuration) training, checking, and currency levels may be reduced.
(6) Installation of Performance Management System (PMS) requires additional training and currency.

FIGURE 6-2

6.3.6 Use of Higher or Lower Difference Levels. Operators must satisfy difference requirements by using the methods acceptable for the specified level or a higher level. Lower level methods may be used in addition to the required levels but may not substitute for the required level or be used exclusively instead of the required level.

6.3.7 Differences Within a Variant Group. Differences may exist even within an individual variant group shown on an MDR table, such as within the B737-200 series. MDR elements may thus show requirements from one B737-200 to another B737-200 or footnotes may be identified. Such requirements however, apply only if pertinent differences exist between those variants.

6.3.8 More than Two Variants. When crew assignments apply to more than two variants, each pertinent requirement of the MDR table applies. Application of multiple requirements for flying many variants and certain limits related to flying large numbers of variants are described in section 9.15.

6.3.9 Base Aircraft. Base aircraft are identified by the operator and are typically the first variant for which crewmembers are qualified, or are the variant of which an operator has the largest number. Base aircraft selection is addressed in section 9.4.1.

6.3.10 Special Requirements.

a. MDR Footnotes. Footnotes can be used to credit, constrain, or set alternate difference levels when special situations apply. Use of footnotes permits accommodation of variations in installed equipment, options, crew knowledge or experience related to other variants or types, training methods or devices, or other factors that are not addressed by basic levels between variant groups. For example, a footnote may allow credit or apply constraints to use of a particular flight guidance control systems (FGCS), flight management systems (FMS), or electronic flight instrument systems (EFIS), which is installed on some aircraft within a variant group. Footnotes are an appropriate means to address requirements which relate to specific systems (e.g., flight director, INS, FMS) rather than a particular variant group. In such instances, generic knowledge or experience with the particular system may be readily transferable between variants or types. Footnotes also may be used to set different requirements for initial training or checking rather than for recurrent training or checking. When necessary, footnotes are fully described in the body of FSB reports.

b. Other Limitations. Other limitations may occasionally be identified within a difference level (e.g., C*/C*/D). The asterisk following the difference level in such instances identifies a special requirement or limitation pertaining to a particular training method or device. Such notes typically relate to acceptable training device characteristics when NSET or standard criteria of this AC are not available to appropriately address a particular situation.

6.3.11 MDR's for aircraft with common or related type ratings. A single FSB report and MDR table may apply to aircraft that are assigned a common type rating or for related types. For example, a single MDR table may cover both the B-767 and B-757 which have a common type rating. When level E training is required for a variant and an additional type rating is assigned within the fleet, such as for the B747 and B747-400, a single MDR table for all variants still applies.

6.3.12 Example Use of an MDR Table. Figure 6-2 shows typical use of the MDR table. A crewmember who primarily flies a B-737-100 as a base aircraft (shown in top row) and also flies a B-737-200 ADV as a variant (left column) in a single bid line during a month's flying is considered to be performing mixed fleet flying. The MDR table identifies minimum requirements which apply (levels B/A/B) as shown by the element of the table which is in both the B737-100 base aircraft column and B-737-200 variant row. Thus, to satisfy FAA requirements for differences, at least level B training, level A checking, and level B currency must achieved. If PDCS, PMS, AFCS, or NAV differences are not a factor between the two variants, footnotes shown in that element amending the levels do not apply. If one or more of these differences do apply, then the credits permitted or constraints required by the footnote apply and are used in lieu of the basic levels. For example, if the B737-200 ADV had PDCS installed and the B737-100 did not, then the minimum difference levels acceptable would be C/B/C.

6.3.13 Minimum acceptable difference levels are assigned based on standard tests or evaluations summarized in section 7 and described in attachment 4.

6.4 Difference Levels.

6.4.1 General Description. Difference levels are formally designated levels of training methods or devices, checking methods, or currency methods which satisfy differences requirements or type rating requirements pertinent to Part 121 Subpart N or O. Difference levels specify FAA requirements proportionate to and corresponding with increasing differences between variants or groups of variants. A range of five difference levels in order of increasing requirements, identified as A through E, are each

specified for training, checking, and currency. MDR's are specified in terms of difference levels. Use of difference levels provides a means to assure uniform compliance with differences provisions of Part 121 and the AQP SFAR. Difference levels apply to operator compliance with FAA requirements necessary to assure safe operations when operators conduct mixed fleet flying. Difference levels also may be used to credit knowledge, skills, and abilities applicable to an aircraft in which an airman is already qualified and is current, during initial, transition, or upgrade training for other related variants.

6.4.2 Basis for Levels. Difference levels apply when a difference exists between variants that affects knowledge, skills, or abilities required of a flight crewmember pertinent to flight safety. If no differences exist, or if differences exist but do not affect flight safety, or if differences exist but do not affect knowledge, skills, or abilities, then difference levels are not assigned or applicable to crew qualification. When difference levels apply, each difference level, A through E, is based on a scale of differences in design features, systems, or maneuvers. The effects of differences consider both flight characteristics and procedures since flight characteristics address handling qualities and performance while procedures include normal, non-normal, alternate (supplementary), and recall items. Limitations are addressed as a subset of various procedures. Difference levels are generally characterized by the following distinctions:

a. Level A - variants which are "functionally equivalent,"

b. Level B - variants which are "functionally similar,"

c. Level C - variants having "part task differences,"

d. Level D - variants having "full task differences," and

e. Level E - variants which are "significantly different."

6.4.3 Relationship Between Training, Checking, and Currency Levels. While particular variants are often assigned the same level (e.g., C/C/C) for training, checking, and currency, such assignment is not necessary. Levels may be assigned independently. For example, a variant may be assigned level C for training, level B for checking, and level D for currency (e.g,. C/B/D).

6.4.4 Type Ratings Related to Difference Levels. Within the difference level system, type ratings are assigned or retained as an adjunct to pilot certification in certain situations. The specific role, criteria for, and

application of the type rating is established and clarified. The application of type rating is based on existing definitions and Part 1, and is consistent with Parts 61 and 91 and criteria in Advisory Circulars 61-57A, 61-89B, the FAA Airline Transport Pilot (ATP) and Type Rating Practical Test Standard, and FAA Order 8400.10. The type ratings are retained as a means for the FAA to permanently track pilot-in-command qualification on a one time basis for aircraft types which retain commonality in handling qualities and at least some equivalence of systems.

6.4.5 Assignment of Type Rating Designations. Variants having the same or an amended type certificate are assigned the same type rating if training differences are less than or equal to level D. Common type ratings are assigned to variants with different type certificates which have training differences less than or equal to level B. Once assigned, however, common type ratings may be retained if differences training for any additional variant remains less than or equal to level D. Variants are assigned an additional type rating when difference training level E is required for one or more variant groups. When an additional type rating is assigned as a result of one or more variants requiring level E, type ratings may be assigned to variants consistent with a logical grouping of the most similar variants.

6.4.6 Difference levels are summarized in figure 6-3 for training, checking, and currency. Definitions of devices or simulators acceptable for particular difference levels are listed in the Advanced Qualification Program Advisory Circular. Complete descriptions of difference levels are given in sections 6.5 for training, 6.6 for checking, and 6.7 for currency.

DIFFERENCE LEVELS

DIFFERENCE LEVEL	TRAINING	CHECKING	CURRENCY
A	SELF INSTRUCTION	NOT APPLICABLE (OR INTEGRATED WITH NEXT PC)	NOT APPLICABLE
B	AIDED INSTRUCTION	TASK OR SYSTEM CHECK	SELF REVIEW
C	SYSTEMS DEVICES	PARTIAL CHECK USING DEVICE	DESIGNATED SYSTEM
D	MANEUVER DEVICES	FULL PC USING DEVICE *	DESIGNATED MANEUVER
E	SIMULATOR C/D OR AIRCRAFT #	FULL PC USING SIMULATOR C/D OR AIRCRAFT *	PER FARs (TAKEOFFS & LANDINGS IN SIMULATOR C/D OR THE AIRCRAFT)

AT LEVEL E - FAA TYPE RATING IS ASSIGNED

** IOE IS REQUIRED

PC • PROFICIENCY CHECK

FIGURE 6-3

6.5 Difference Training Levels.

6.5.1 Level A Training. Level A difference training is that training applicable to functionally equivalent aircraft which can adequately be addressed through self instruction by a crewmember. Level A training represents a knowledge requirement such that, once appropriate information is provided, understanding and compliance can be assumed to take place. Level A compliance typically is achieved by methods such as issuance of operating manual page revisions, dissemination of flight crew operating bulletins or differences handouts to describe minor differences in aircraft. Level A training is limited to situations such as the following:

a. The change introduces a different version of a system/component for which the flight crew has already shown the ability to understand and use (e.g., an updated version of an engine).

b. The change results in minor or no procedural changes and does not result in adverse safety effects if the information is not reviewed or is forgotten (e.g., a different vibration damping engine mount is installed... expect more vibration in descent; logo lights are installed... use is optional).

c. Information that highlights a difference which once called to the attention of a crew is self-evident, inherently obvious, and easily accommodated (e.g., different location of a communication radio panel, a different exhaust gas temperature limit which is placarded, or changes to non-normal "read and do" procedures).

6.5.2 Level B Training. Level B difference training is that training applicable to functionally similar aircraft which can adequately be addressed through aided instruction of a crewmember. At level B aided instruction is appropriate to ensure crew understanding, emphasize issues, provide a standardized method of presentation of material, or to aid retention of material following training. Level B aided instruction typically employs means such as slide/tape presentations, computer based tutorial instruction, use of stand-up instructors, or video tapes. Situations not covered under the provisions of level A, shown by 6.5.1 items a through c, above require level B (or higher levels if certain tests described later are failed).

6.5.3 Level C Training. Level C differences training is that training which can only be accomplished with devices which are capable of systems training. Level C differences training is applicable to variants having "part task" differences which affect skills or abilities as well as knowledge. Training objectives focus on mastering individual systems,

procedures, or tasks, as opposed to performing highly integrated flight operations and maneuvers in "real time." Level C may require self instruction or aided instruction of a crewmember, but cannot be adequately addressed by a knowledge requirement alone. Training devices are required to ensure attainment or retention of crew skills and abilities to accomplish the more complex tasks, usually related to operation of particular aircraft systems. At level C systems knowledge or skills relate to specific tasks rather than fully integrated tasks. At level C performance of steps to accomplish normal, non-normal, alternate, recall procedures, or maneuvers related to particular systems (flight guidance control systems/flight management systems) may, however, be necessary. Typically, level C requires use of cockpit systems simulators, cockpit procedure trainers, part task trainers (e.g., inertial navigation system (INS), flight management system (FMS), or traffic collision avoidance system (TCAS) trainers or similar devices. At the high end of level C, devices may approach fixed base simulators in terms of complexity. Flight training devices level 2 through 5 are typically acceptable for level C differences training. Flight training devices level 6 or 7 or any simulator can also satisfy differences training level C requirements provided that device or simulator can accomplish the training objectives.

6.5.4 Level D Training. Level D training is training which can only be accomplished with devices capable of performing flight maneuvers and addressing full task differences affecting knowledge, skills, and/or abilities. "Flight maneuver" capable devices address full task performance in a dynamic "real time" environment. Such devices permit integration of knowledge, skills, and abilities in a simulated flight environment, involving combinations of operationally oriented tasks and realistic task loading for each relevant phase of flight. At level D knowledge and skills to complete necessary normal, non-normal, alternate, or recall procedures are fully addressed for each variant. Crews can adequately accomplish each relevant task except those which specifically require a "high fidelity" environment such as provided by motion or visual cues to properly accomplish a task or maneuver. Level D training requires mastery of interrelated skills which cannot be adequately addressed by separate acquisition of a series of knowledge areas or skills that are interrelated. At level D, use of a series of separate devices for systems training would not suffice if demonstrating interrelationships between the systems is important. Level D training devices have correct integration of systems and controls and realistic instrument indications, but factors such as visual cues, motion cues, dynamics, control loading or environmental conditions may be simplified or absent. Weather phenomenon such as low visibility, Cat III, or wind shear may not be incorporated. Where simplified or generic characteristics of a type are used in difference training level D devices, significant negative training must not occur as a

result of the simplification. At the upper end of differences training level D, acceptable devices may approach C/D simulator characteristics including actual handling characteristics, full equations of motion, control loading, and other factors, but may not necessarily have motion or visual cues or accurate environmental modeling. Devices typically acceptable for training level D include those devices where relevant elements of aircraft flight maneuvering, performance, and handling qualities are incorporated, even though in a simplified or generic fashion, such as fixed base non-visual simulation, and fixed base visual simulation. Accordingly, devices acceptable for level D training include those which meet FAA criteria for:

a. training device level 6 or level 7, or

b. simulators A or B (formerly called visual or phase I simulators).

6.5.5 Level E Training. Level E is training applicable to aircraft having "full task" differences which also requires a "high fidelity" environment to attain or maintain knowledge, skills, or abilities. The term "high fidelity" in this context relates to devices that throughout the applicable flight envelope comprehensively and accurately model at least the following:

a. systems, controls, indications, performance and dynamics;

b. motion, visual, and audio cues;

c. environmental, and other relevant external factors.

Level E provides a realistic and operationally oriented flight environment achieved only by use of C or D simulators (formerly phase II or phase III simulators) or the aircraft itself. Level E training in an aircraft, however, may be restricted for safety reasons regarding maneuvers which introduce a high degree of risk in attempting to simulate non-normal configurations or adverse environmental conditions. As with other levels, when level E training is assigned, suitable credit or constraints may be applied for knowledge, skills, and/or abilities related to other pertinent variants. Credits or constraints are specified for the subjects, procedures, or maneuvers shown in FSB reports and are applied through ODR tables. When level E training differences are designated for one or more variants, the FAA tracks pilot-in-command (PIC) certification separately in the form of a different pilot type rating. Level E training is required for any variant considered significantly different from a base aircraft. The assignment of difference training level E and an additional type rating generally correlates with significant differences in handling qualities.

In certain instances, major systems differences could lead to assignment of level E if high fidelity simulation (simulator C or D) is required to achieve training objectives.

6.6 Difference Checking Levels.

6.6.1 Initial and Recurrent Checking in General. Differences checking addresses any pertinent airmen testing or certification including type rating checks, proficiency checks, AQP evaluations, and any other checks specified by FSB reports. Initial and recurrent checking levels are the same unless otherwise specified by the FSB. In certain instances it may be possible to satisfactorily accomplish recurrent checking objectives in devices which do not meet initial checking requirements. In such instances and if approved by the FSB and the POI, certain devices not meeting initial check requirements may be approved for use for recurring checks. However, the FAA may require checking in the initial level device when doubt exists regarding airman competency or program adequacy. In addition to type rating, proficiency checks, AQP evaluations, and other checks, initial operating experience (IOE) may be required in conjunction with certain difference checking levels. section 6.6.7 addresses initial operating experience which is to be completed following checking. For AQP programs, differences checks may be addressed by or included in other specified evaluations.

6.6.2 Level A checking. Level A checking denotes that a check related to differences is not required at the time of differences training. However, a crewmember is responsible for knowledge of each variant flown, and differences items may (or should) be included as an integral part of subsequent recurring proficiency checks.

6.6.3 Level B checking. Level B checking denotes a "task" or "systems" check is required for initial and recurring differences training. Level B checking typically applies to particular tasks or systems such as INS, FMS, TCAS, or other individual system or related groups of systems.

6.6.4 Level C checking. Level C checking denotes that a check using a level C device is required for initial and recurring differences training. The partial check is conducted relative to particular maneuvers or systems designated by the FSB. Level C requires a check performed using a "dynamic" flight environment, and is done using devices required or permitted by level C training or higher. An example of a level C check would be evaluation of a sequence of maneuvers demonstrating a pilot's ability to use a flight guidance control system or flight management system. An acceptable scenario would include each relevant phase of flight but would not necessarily address maneuvers that do not relate to set up or

use of the FGCS or FMS.

6.6.5 Level D Checking. Level D checking denotes that a full proficiency check (PC) is required for each variant following both initial and recurrent training. However, in conducting the proficiency checks, maneuvers common to each variant may be credited and need not be repeated. The proficiency check is conducted in accordance with particular maneuvers, systems, or devices designated by the FSB. Level D checks are performed using scenarios representing a "real time" flight environment and use devices permitted for level D or higher differences training. Level D checks may be administered in devices approved for related level D training and may be limited by the capabilities of that device. Typical level D checks include at least a full poficiency check in one variant and a partial PC in the other variant (e.g., 1 1/2 PC's at each normally scheduled PC). The partial PC covers all pertinent maneuvers except those common to both variants. The equivalent of two proficiency checks are completed considering any credit for common maneuvers. PC maneuvers typically are completed in the differences level D device for one of the variants and in a C/D simulator (phase II/III simulator) for the other variant. Proficiency training may alternately be substituted for proficiency checks as permitted by FAR 121, but when such training is substituted, appropriate training must be completed for each variant. Maneuvers from Part 121, Appendix F or AQP flight qualification events apply except where limited by the capabilities of a differences level D device.

6.6.6 Level E Checking. Level E checking denotes that a full proficiency check is conducted in a C or D simulator or aircraft, for each variant, and for both initial and recurrent differences training. Alternating checks in accordance with section 121.441 are permitted. Either training or checking in each level E variant is required each 6 months unless alternating checks are accomplished each 6 months as is required for flying two separate and unrelated types. Credit for maneuvers common to level E variants may be permitted, but level E devices must be used for each variant for specified maneuvers. Proficiency checks or AQP evaluations are conducted in accordance with particular maneuvers, systems, or devices designated by the FSB. Level E checks are performed consistent with ATP and Type Rating Practical Test Standard or Order 8400.10 criteria using at least a simulator C or D (phase II/III) or an aircraft. When level E is assigned as a result of a level determination test process, suitable credit may be applied for knowledge, skills, and/or abilities common to checks on pertinent level E variants. Common knowledge, skills, and/or abilities for variants are reflected in checking requirements through procedure or maneuver credits defined by the FSB and by credits or limitations on devices used for checks. When level E is assigned to a variant, the POI,

the NSET, and if necessary the FSB, determine allowabel credit for checks in other variant's C and D simulators, defines any procedure and maneuver credits or limitations for parts of checks given in differences level C or D devices used in conjunction with the level E simulators or aircraft, and specifies any necessary credits or limitations for initial operating experience, line orientated flight training, or line orientated simulation pertinent to each variant. Assignment of level E checking requirements alone or in conjunction with level E currency does not result in assignment of a separate type rating by the FAA.

6.6.7 Initial Operating Experience (IOE) for Variants.

6.6.7.1 Application of IOE to Variants. Requirements for IOE are consistent with provisions for IOE specified under Part 121 and for AQP online evaluations. However, applicability of IOE to certain variants is clarified based on the significance of various difference levels. Accordingly, limitations on IOE may be specified, credit for IOE in similar variants may be permitted, particular types of IOE may be specified when necessary, and completion of IOE using simulators may be permitted in certain instances for variants. While IOE is completed for a particular type in accordance with FAR 121.434, additional IOE beyond that required for a particular type may be needed to address variants. Portions or all of such additional IOE may be completed in simulation when so designated by the FSB. Application of IOE or AQP online evaluations for variants is specified in FSB reports and MDR's in conjunction with difference checking levels.

6.6.7.2 Supervised Line Flying (SLF). Supervised line flying is a form of IOE which may be specified in certain circumstances. SLF is a specific type of IOE in which a pilot occupies a specific crew position and performs particular assigned duties related to postqualification skill enhancement while under supervision. Supervision is by an airmen qualified to conduct the SLF and is typically a check airman. SLF is not acccmplished by observation from a jumpseat. SLF is not accomplished until after a crewmember is trained and, if applicable, checked to perform duties for that particular crew position. In some instances, IOE must be conducted as supervised line flying and is so identified when MCR's and ODR's are approved.

6.6.7.3 Purposes for IOE/SLF. There are a variety of reasons why the FSB and principal inspectors specify IOE or SLF in conjunction with master difference requirements. One or more of the reasons described below may apply:

a. Introduction of new aircraft types or variants;

b. Introduction of new systems (e.g., PMS, TCAS, Omega, INS);

c. Introduction of new operations (e.g., oceanic operations);

d. Experience for a particular crew postion (e.g., PIC, SIC, F/E);

e. Postqualification skill refinement (e.g., refining alternate or multiple ways to use particular equipment to increase operating efficiency, operating flexibility, or convenience);

f. Special characteristics (e.g., unique airports, mountainous areas, unusual weather, special air traffic control procedures, non-standard runway surfaces, etc.).

6.6.7.4 IOE/SLF Credits or Constraints. IOE or SLF may be specified for variants in conjunction with any difference checking level and may be tailored to specific difference level objectives. Credit for common systems, procedures, or maneuvers with other variants is permitted. Credit toward IOE/SLF may also be permitted for certain LOFT experience. At difference checking levels A through D, IOE time requirements described in Part 121 do not apply. Simplified or reduced time IOE/SLF may be administered and constrained only by FSB requirements. IOE or SLF is required and is specified at levels D and E by the FSB in MDR's. IOE must meet Part 121.434 requirements at level E, except that credit for applicable IOE in other variants may be permitted by the FSB. When approved by the FAA, IOE/SLF related to differences may be accomplished as part of or in conjunction with AQP online evaluations or LOS.

6.7 Difference Currency Levels.

6.7.1. The terms "Currency" and "Recency of Experience." The term currency as used in this AC addresses recent experience necessary for safe operation of aircraft types or variants as designated by the FSB. When addressing flight experience required by section 121.439, currency is considered to have the same meaning as recency of experience.

6.7.2 Level A Currency. Level A currency is currency which is considered to be common to each variant. Thus, assessment or tracking of currency for separate variants is not necessary or applicable. Maintenance of currency at level A in any one variant or a combination of variants suffices for any other variant.